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ABSTRACT

Specifications for making adaptable dwelling units, minimally accessible designs which can later be inexpensively remodeled for the disabled, are presented. Advantages to providing many adaptable units rather than a few accessible ones are outlined, including eliminating the marketing problem, providing a disabled person with a wider choice of apartment types, and serving as a housing option for the elderly. Specifications are listed for outside areas (parking, public walkways, access to play areas, entry ramps, and stairs) and inside areas (public facilities, elevators, circulation, kitchens, bathrooms, alarm systems, and controls). Drawings and illustrations are provided. (CL)

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A concept to make all housing accessible

HOUSING ADAPTABILITY GUIDELINES

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September, 1979

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Department of Rehabilitation State of California

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introduction

2

introduction

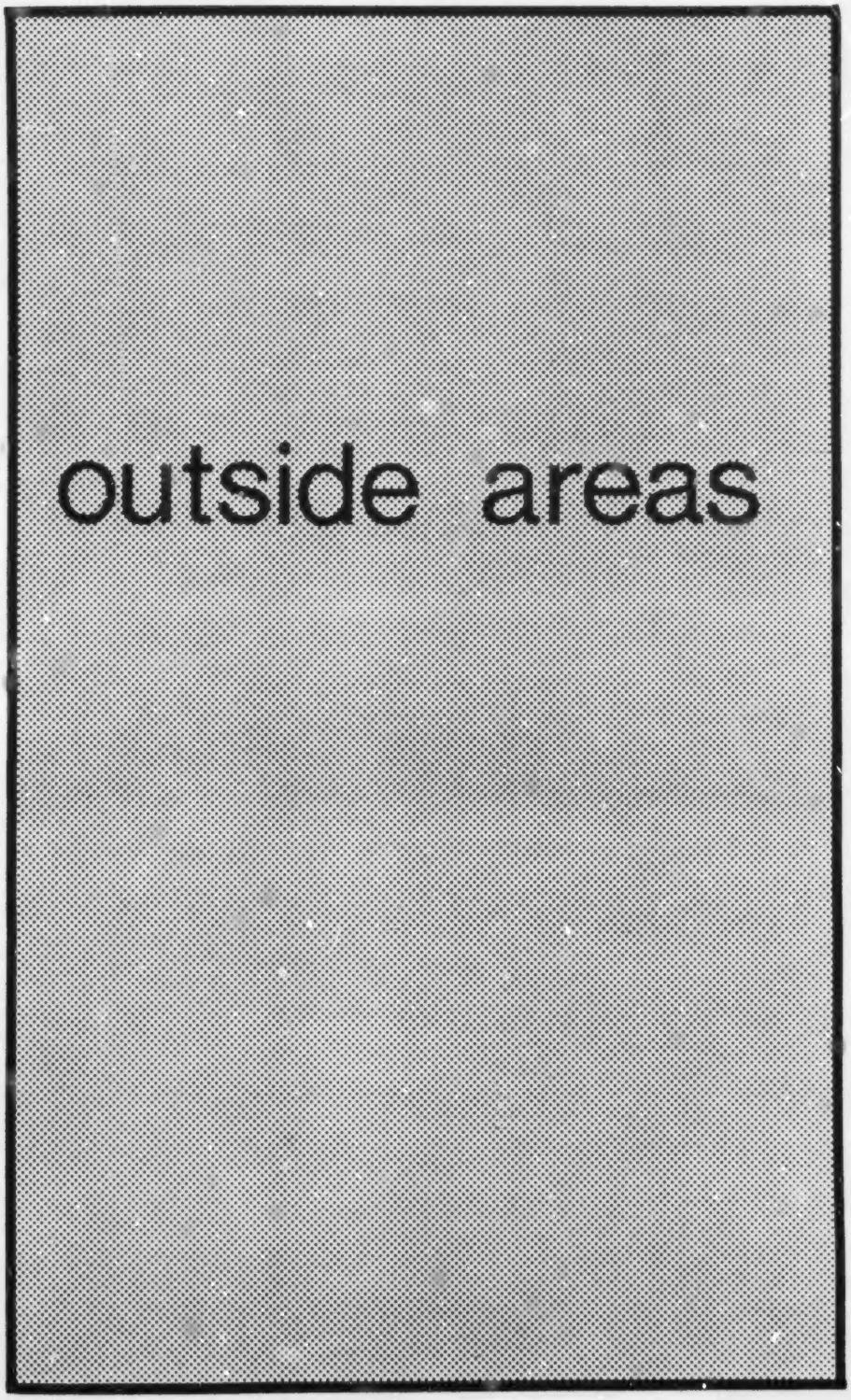
The definition of an adaptable dwelling unit is that it be initially accessible to disabled people in terms of entry and circulation, and adaptable through minor renovations and additions to use as a residence by disabled people. Some of the items that are initially provided, such as the structural reinforcement in the bathroom walls for the eventual use of grab bars, make it easier and less expensive for this later conversion to an accessible unit.

There are a number of advantages to providing many adaptable units rather than a few accessible ones. First, there is not the usual marketing problem of waiting to rent an accessible unit until a disabled person shows up. Secondly, since all or many apartments will be minimally accessible, disabled people will be able to visit with able-bodied friends. Third, those items that make the unit adaptable will eventually become standardized, and the conversion of a unit to accessibility will be inexpensive. Fourth, it provides a disabled person with a wider choice of apartment types.

In addition to these advantages, an adaptable dwelling unit also provides a more responsive setting for exercising highly personal adaptations. As the consumer acceptance study demonstrated, disabled people do not want grab bars or openings under counters unless their specific condition warrants it. Moreover, they are often very creative in making adjustments to their dwelling units. The idea of adaptability fits well with such attitudes and abilities.

Furthermore, in units designed for families, the concept of adaptability recognizes that if only one family member is disabled, it is not always best to have an entire dwelling unit adapted to his or her needs. For example, if a husband or child is a wheelchair user, and their wife/mother does all the cooking and dishwashing, it would be inconvenient for her to have counter heights at 28 or 32 inches--good heights for wheelchair users.

Finally, this concept recognizes that able-bodied people may become severely disabled, either permanently or temporarily. The most important consideration here is in housing for the elderly, where having an adaptable dwelling unit may mean the difference between staying in their familiar living environment or relocating.


outside areas

parking

1

Local requirements for parking spaces shall continue to apply. Under the Adaptability Guidelines, however, there are no specific requirements for parking. Since one of the advantages of adaptability is flexibility, this concept can be carried over to parking as well. Most local building codes require 1-1/2 to 2 parking spaces per unit in multi-family housing. This allotted space is sufficient to serve a vehicle used by a person with a disability. The spaces assigned to persons with disabilities shall be located as close as possible to the building entry. In addition, they shall be located so that disabled people will not have to cross vehicular traffic to exit from the parking lot, and a ramp at a ratio of 1:12, or a curb cut, each with a heavy broom finish, shall be provided in the sidewalk if the parking is not on grade. If there is no specifically assigned handicapped parking space, then one shall be restriped as a 12' wide space and properly identified.

walkways

2

Access by the handicapped to primary entrances, and access to and along normal pedestrian ways, both on and surrounding the site, shall be provided through site grading or the development of pedestrian ramps.

All public walkways shall be a minimum of 48 inches wide with a broom finish and a maximum slope of 1:20 (5%).

Cross slopes shall not exceed 1/4 inch per foot.

play areas

3

At least one of the play areas, when provided, shall be accessible to the handicapped.

entry ramps

4

In most cases where buildings are located on fairly flat sites, the entry ramp situation would be quite simple. The sidewalk leading to the entry could be sloped to the typical six-inch entry step. With a six-inch rise, the ramp could be six feet long, which would provide a slope (8.3%) with a ratio of 1:12. If the ramp is longer than six feet, it will require handrails.

All ramps shall have a minimum width of 36 inches.

Ramps shall be sloped not to exceed a maximum rise-to-run ratio of 1:12 (8.3%). The maximum horizontal run shall be 30 feet.

For ramps provided with railings, there shall be either 2" minimum curbs on both sides, or the ramp shall extend a minimum of 6" beyond the outsides of both railings. For ramps without railings, there shall be a 2" minimum curb on both sides of the ramp.

There shall be level landings at the top and bottom of each ramp run that are as wide as the ramp and a minimum of five feet deep.

For ramps having a horizontal run greater than six feet, and a slope greater than 1:20, handrails shall be provided on both sides.

The handrails shall have the following features:

Height: 30-34 inches measured from the surface of the ramp to the top of the handrails.

Extensions: A one-foot extension beyond the top and bottom portion of the ramp or at an intermediate landing where the handrails are not continuous.

Clear Space: Ramps along a wall shall be provided with a clear space of 1-1/2" to allow one to grasp the handrail.

stairs 5

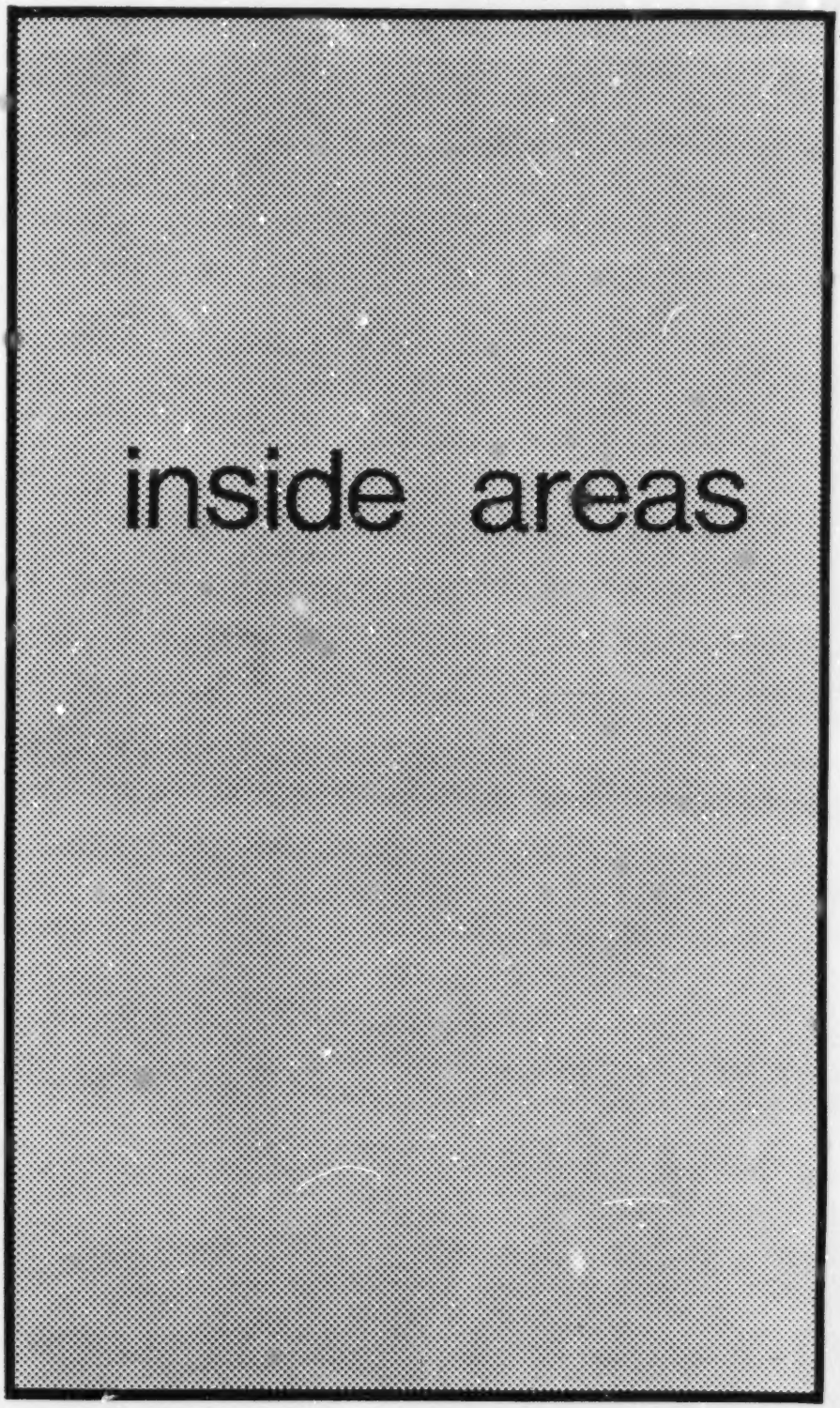
Stairs occur both outside and inside of residential buildings. The Adaptability Guidelines require barrier-free access to building entries; however, stairs may also be provided and used by people with disabilities that do not necessitate the use of a ramp.

Only those stairs which service levels or floors not served by lifts or elevators require the following barrier-free design considerations:

Treads: Shall be a minimum run of 11 inches.

Nosings: Shall not have abrupt shapes (tread edge curvature with a maximum 1/2" radius) or nosing projections more than 1-1/2".

Handrails: Shall be provided at both sides of stairs, be mounted at a height of 30" - 34" above tread or landing, and should have the handrails extend beyond the top and bottom riser. At the top the handrail should extend 12", and at the bottom the handrail should extend 12" plus the width of the treads. Projected ends should return smoothly to a wall, the floor, or a post.


inside areas

public facilities 6

All public facilities within the public areas of the building, e.g., lobbies, game rooms, public toilets, etc., shall be accessible to the handicapped. These facilities, including ramps and single-occupancy toilets, are discussed in these Housing Adaptability Guidelines.

elevators 7

Elevators shall be located along a major accessible path of travel from the building entries. Publicly-used elevators shall comply with all applicable state and federal safety standards and codes. The elevators' operation shall be automatic and self-leveling, with a 1/2" vertical tolerance and a maximum clearance between car and landing of 1-1/4".

The elevator cars shall be planned to allow wheelchair maneuvering space for entering, reaching controls, and exiting the car. The minimum inside dimensions of cars with a capacity of less than 2,000 lbs. shall be 54" in width and 54" from the rear wall to the inside face of the doors. Other cars shall have a minimum of 68" in width. In buildings where the elevator serves a total occupancy of more than 50 persons, there shall be at least one car large enough to accommodate an ambulance stretcher in its horizontal position. Automatic doors to the cars shall have a minimum clear opening of 32" on smaller cars and 36" on larger cars, may be front or side opening, and shall be equipped with an automatic re-opening device effective for a minimum of 20 seconds.

Controls and signaling devices shall be designed to provide visual, audible, and tactile as well as Braille information on the elevator's operation.

- Floor designations shall be a minimum of 2" high, raised characters on contrasting backgrounds and Braille symbols located 5' above the floor on both jambs of the hoistway entrance.

- Call buttons shall be a minimum of 3/4" diameter, raised or recessed 3/8", located 42" from the center line of the buttons to the floor, and shall visually indicate when each call is made and served.

- Elevator travel direction signals (arrow shapes preferred) shall have a minimum dimension of 2-1/2" and be positioned a minimum of 72" above the floor on the wall or in the car, provided the signal is visible from the call button location. In addition to the visual signal, there shall be an audible signal which sounds once for up and twice for down.

- Elevator car controls shall be positioned on the front or side wall of the car next to the door and located at a height between 35" minimum and 54" maximum. The controls shall be a minimum of 3/4" in diameter. 5/8" raised Arabic numerals and symbols as well as Braille symbols shall be located to the left of the control.

- Emergency controls, including Open Door, Close Door, Alarm Bell, shall be grouped together at the bottom of the control panel, with the emergency alarm at the far left and the emergency stop at the far right.

- Emergency communications shall be positioned a maximum of 48" above the car floor and identified with a raised symbol. Hand sets shall have cords with a minimum height of 29" and a maximum of 36".

- The level of illumination of the controls shall be a minimum of 5 foot candles.

circulation

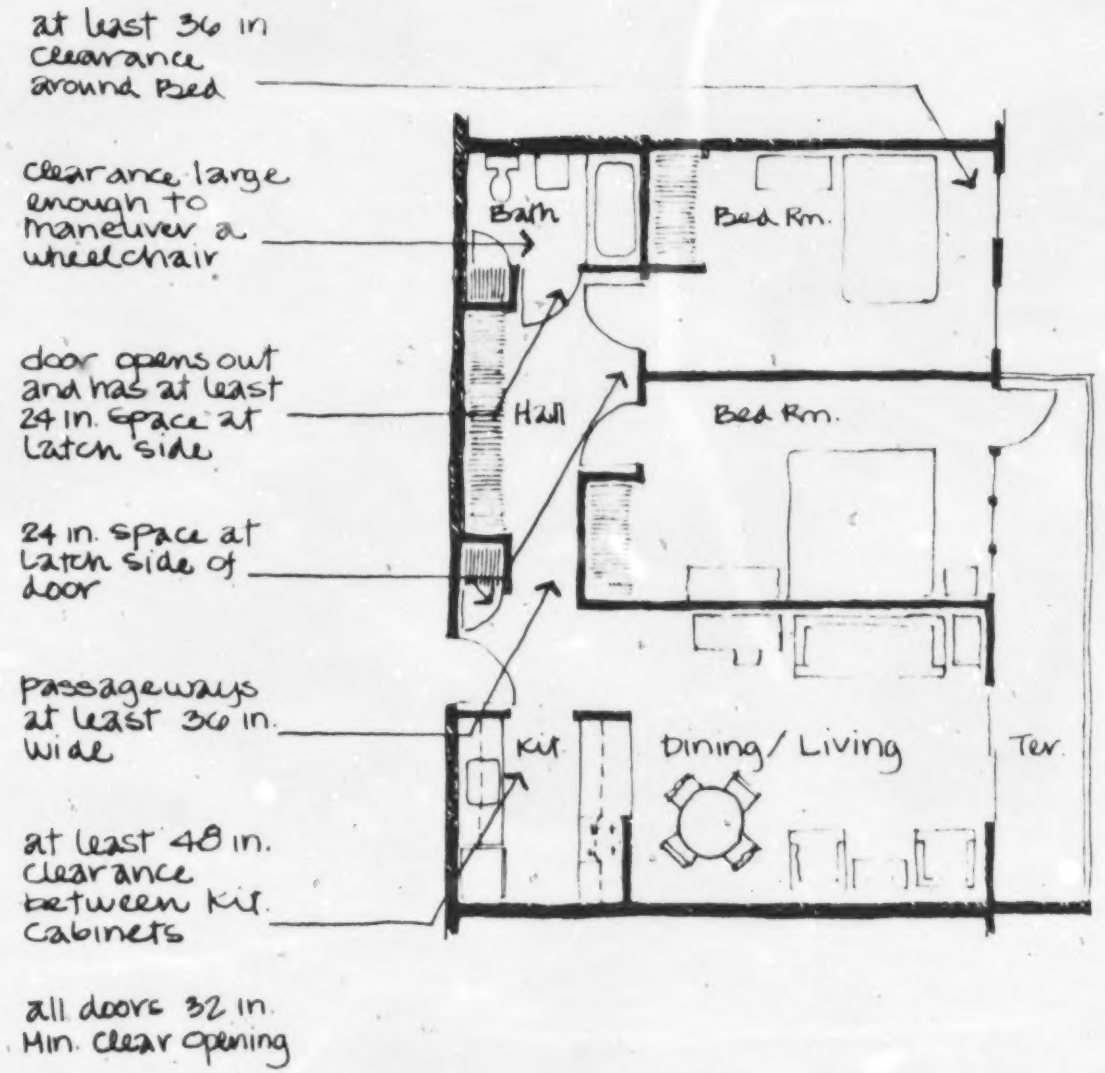
8

Circulation is typically one of the major problems a disabled person has to face. An adaptable unit shall have at least one path of travel without stairs, from the front door of the housing unit to at least one of each of the following rooms or spaces: kitchen, dining, bedroom, bathroom, living room and storage.

Doors shall be side enough for passage by a person in a wheelchair. Maneuvering clearances at doorways and in halls shall be large enough for a person to negotiate in a wheelchair. This means that such an individual can gain entry to all rooms and outdoor spaces necessary for the above activities, although there may be other rooms to which they can not gain access. For example, the master bedroom and one bedroom for a child in a dwelling unit designed for families shall be accessible, but additional bedrooms can be on a second story, reachable only by stairs. A full bathroom shall be accessible, but a second bathroom may be provided that is also on the second floor. This is a situation, for example, that might occur in a townhouse unit. The clearances required can be provided by careful design without addition space to a conventional dwelling unit's floor area.

Following is an example of circulation standards for a typical two-bedroom housing unit.

typical circulation


at least 36 in clearance around Bed
clearance large enough to maneuver a wheelchair
door opens out and has at least 24 in. space at latch side
24 in. space at latch side of door
passageways at least 36 in. wide
at least 48 in. clearance between kit. cabinets
all doors 32 in. Min. clear opening
Bath
Bed Rm.
Hall
Bed Rm.
Kit.
Dining/ Living
Ter.

thresholds

The maximum height of thresholds at doorways shall be 1/2 inch. Thresholds shall be beveled. If floor surfaces on one side of an interior door are higher than on the other, then the maximum height difference shall be no more than 1/2 inch, and the edge shall be beveled.

doorways

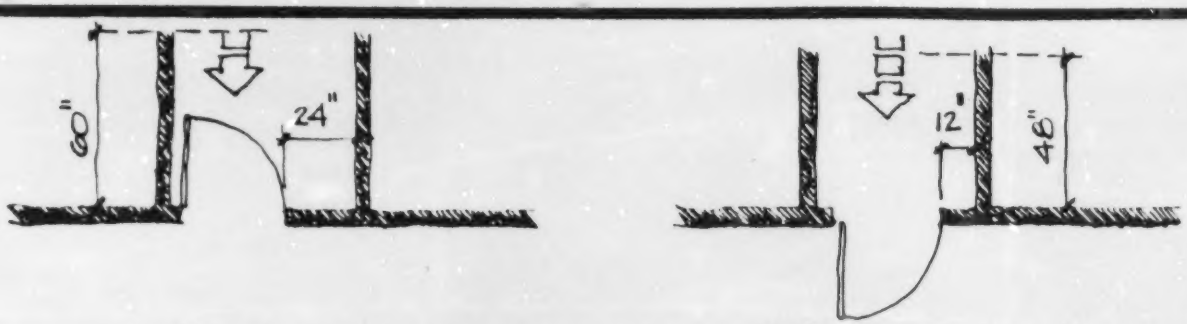
Passage doorways shall have a minimum 32 inch clear opening. Typically a 32 inch clear opening would necessitate a 34 inch door. An alternative to that is the use of special offset hinges allowing the door to swing clear of the opening.

hallways

Hallways and corridors shall have a minimum clear width of 36 inches. A hallway or corridor with a 180-degree turn around a wall shall have a 42 inch wide space. Although people who use walking aids can maneuver through clear openings of 32 inches, passageways and walks must be wider to allow comfortable and convenient gaits. Some individuals who use walking aids must use a spread of crutch tips greater than 32 inches. Passageways and walks with a 36 inch clear width along their entire lengths will accommodate most people who use walking aids.

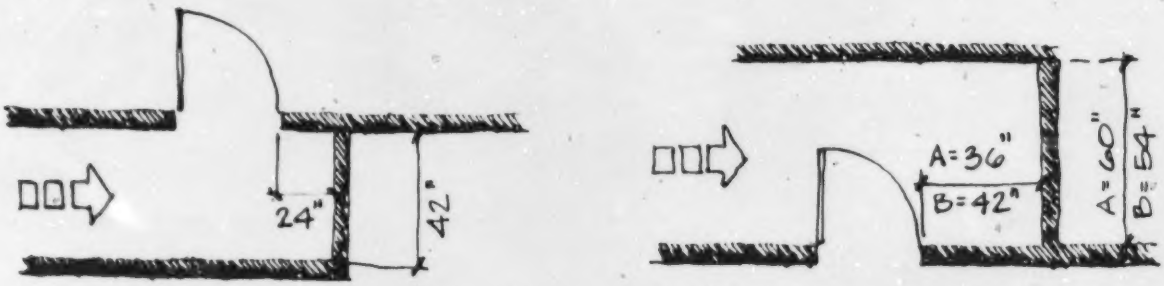
For hallways and corridors with doorways, the following diagrams shall indicate the minimum requirements.

hallways



Doors approached from the front when the door swings in toward the user shall provide a clear level space of 60" in front of the door and 24" at the strike side of the door. Where the door swings away from the user, only 48" is necessary, and 12" at the strike side of the doorswing.

Doors approached from the latch side when the door swings in shall require a corridor width of 42"; and where doors swing out toward the user, the width of the corridor shall be 48".



Doors approached from the hinge side when the door swings in shall require a corridor width of 42", with 24" provided on the strike side of the door. If the door swings out toward the user, the corridor shall be 60" wide with 36" provided on the strike side of the door, or 54" wide with 42" provided on the strike side of the door.

kitchen 9

Kitchens should allow sufficient space for maneuvering wheelchairs. They also should provide storage units within reach of people using wheelchairs and alternate working heights at counter tops and fixtures.

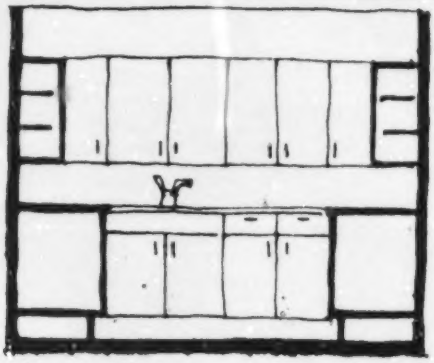
This can be accomplished by designing conventional base cabinet fronts to be removable at the mix center and sink. This will allow a clear space to be provided underneath when the fronts are removed. Upper cabinets shall be mounted at a height of 48 inches to the bottom shelf. Counter tops at the sink and mix center shall be designed so that they can be lowered to at least 32" and 28" (see drawings on page 16). Rough-ins for the plumbing to the sink shall be at a position that will accommodate the lowest position of the sink. Clearances should be large enough for passage by a person using a wheelchair. This means that before adaptation the kitchen will be conventional in appearance. The only difference would be that upper cabinets would be slightly lower (12 inch clearance to counter tops instead of 15 inches) and that counter tops may have seams where the adjustable areas meet fixed areas. Conventional clearances for passage are sufficient.

In addition, ovens shall be self-cleaning or wall-mounted.

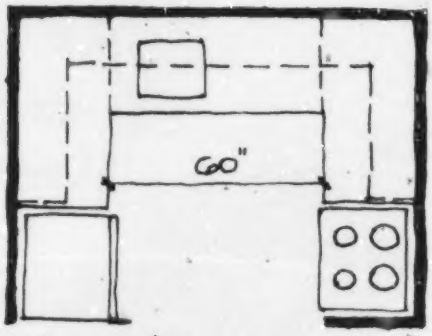
Clear areas in front of mix center, sink, refrigerator, stove and floor-mounted cabinets should be large enough to allow a person in a wheelchair to maneuver within reach of equipment and storage areas.

Clearances between cabinet fronts, counter tops or walls shall be 60 inches minimum for U-shaped kitchens, and 48 inches minimum for all others.

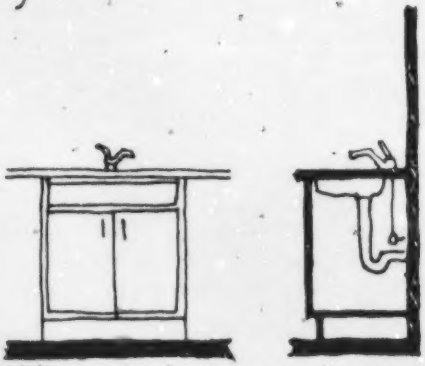
adaptable kitchen



Adaptable Kitchen - Elevation
(Before)

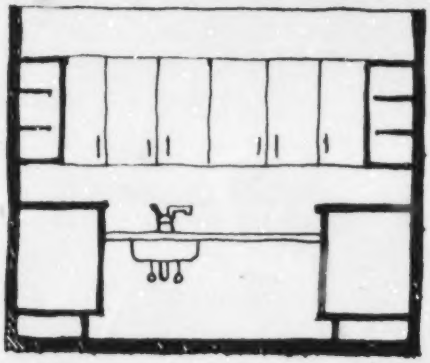


Adaptable Kitchen - Plan
(Before)

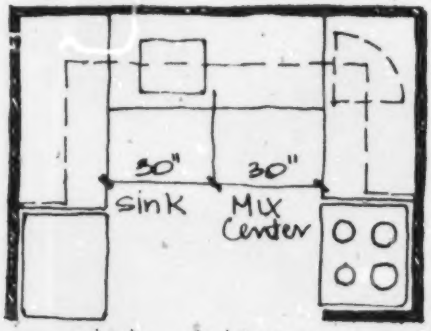


Adaptable sink/counter
(Before Base Cabinet removal)

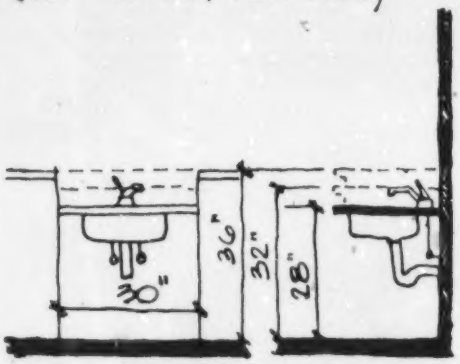
accessible kitchen



Accessible Kitchen - Elevation

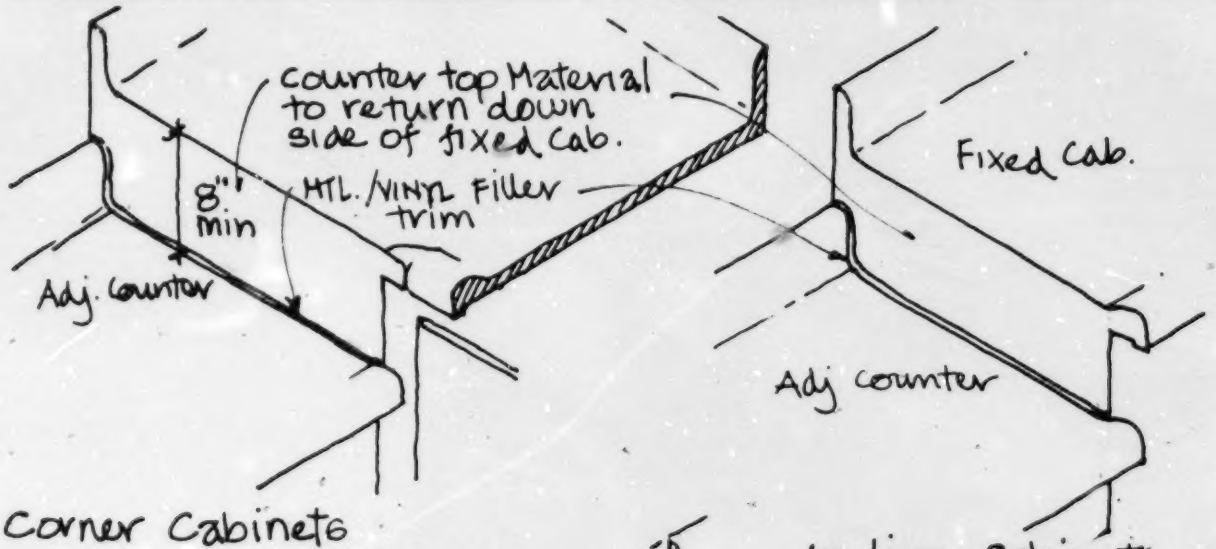


Accessible Kitchen - Plan
(After cabinet removal)



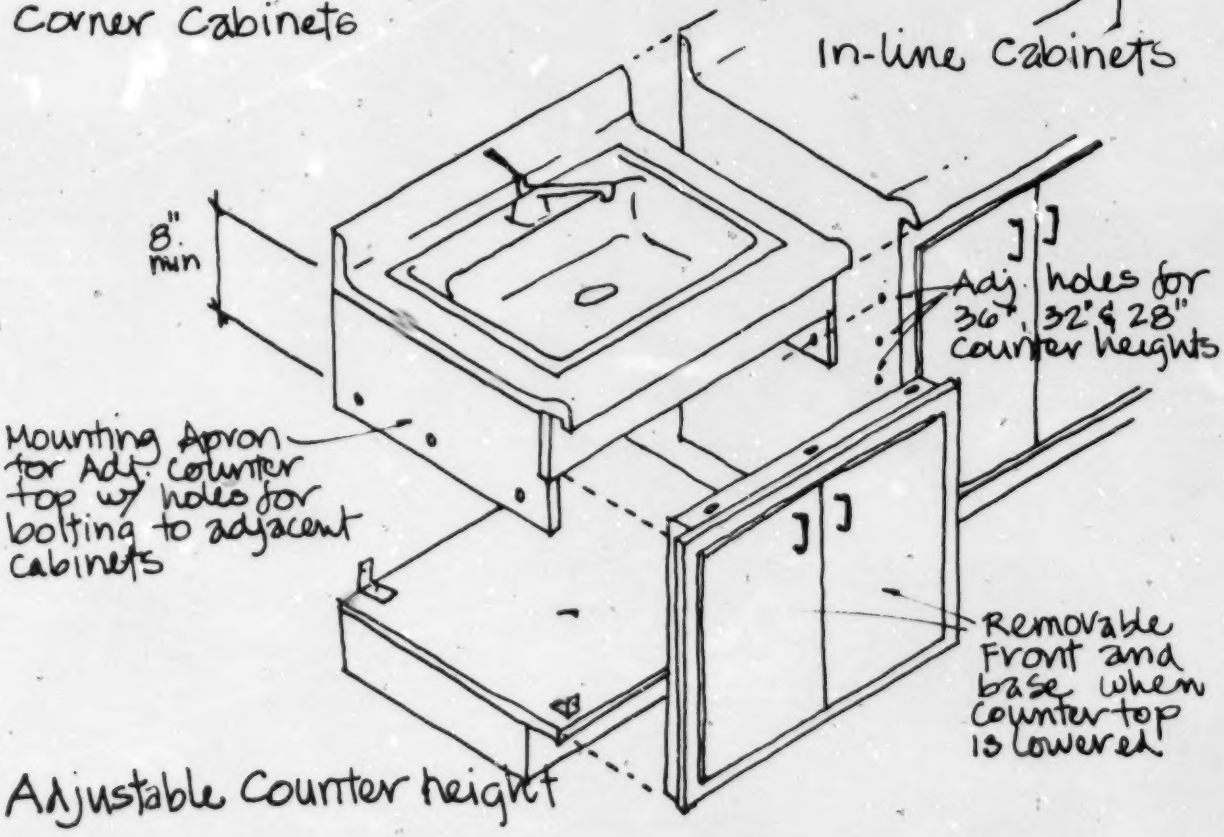
Accessible sink/counter
(with height alternates)

adjustable counter



Corner Cabinets

In-line Cabinets


8" min
Adj. holes for 36", 32" & 28" counter heights
Mounting Apron for Adj. counter top w/ holes for bolting to adjacent cabinets
Removable Front and base when countertop is lowered

Adjustable Counter height

bathrooms 10

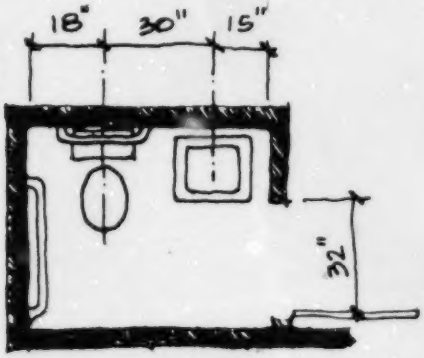
Bathrooms should have enough space for maneuvering wheelchairs, provisions for future installation of supports needed to transfer to and from toilets, bathtubs and showers, and fixtures at comfortable heights. A handicapped bathroom can be accommodated in a conventional 5' x 8' space.

Fixtures should be located with respect to each other and to walls so that grab bars can be installed where and when needed. Clearances necessary to maneuver a wheelchair into a transfer position shall be provided at each fixture.[1] Structural reinforcement shall be provided in the walls at places where grab bars may be installed. Lavatories can be mounted at a fixed height with knee clearances underneath. The clearances required do not result in overly large bathrooms; proper design can allow the use of conventional minimum-sized bathrooms that meet these design criteria. Since grab bars do not have to be provided, there will be no difference in the appearance of the bathroom.

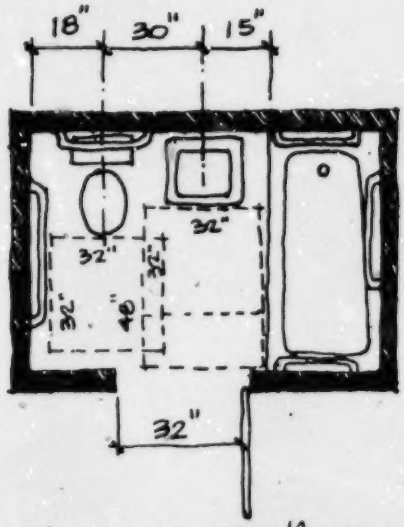
If cabinets are provided under lavatories, they shall be removable to allow a person in a wheelchair to use them.

1. See following diagrams and drawings.

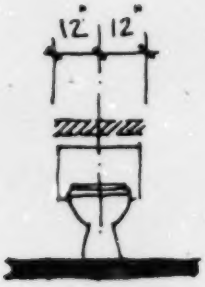
typical bathroom

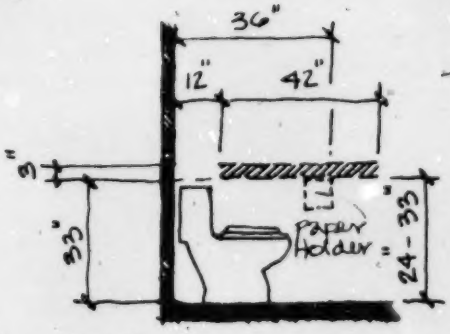


Typical Lavatory



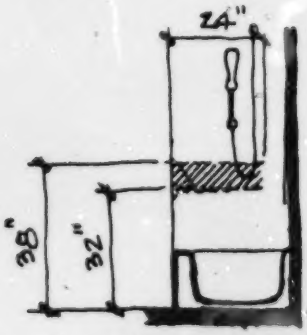
Typical Bathroom

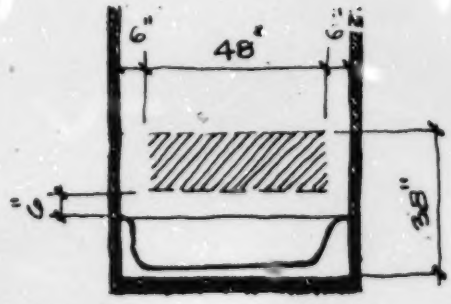


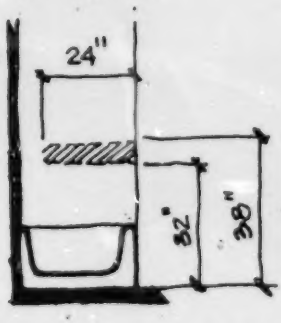


provide structural reinforcement that will allow installation of Grab Bars in the Locations shown in the cross hatched areas

Toilet - Grab Bar Locations

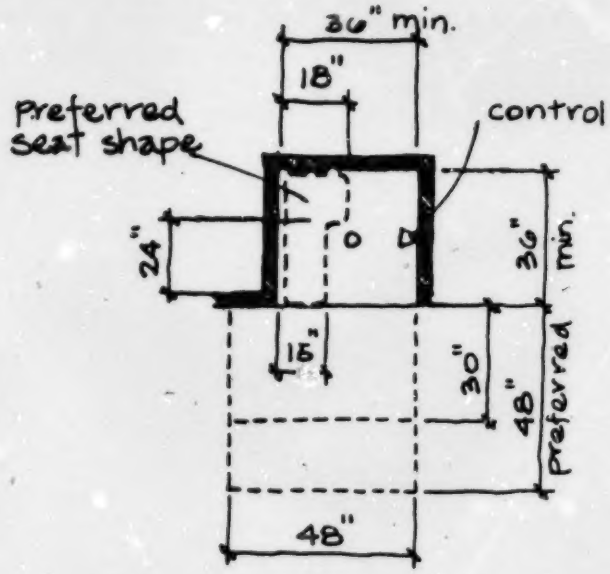




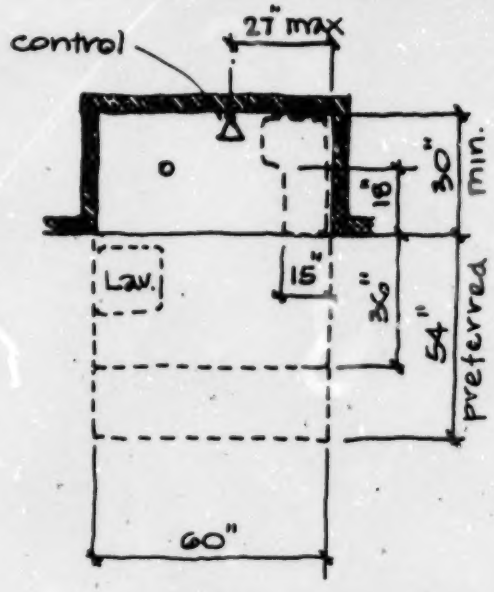


Tub Enclosure - Grab Bar Locations

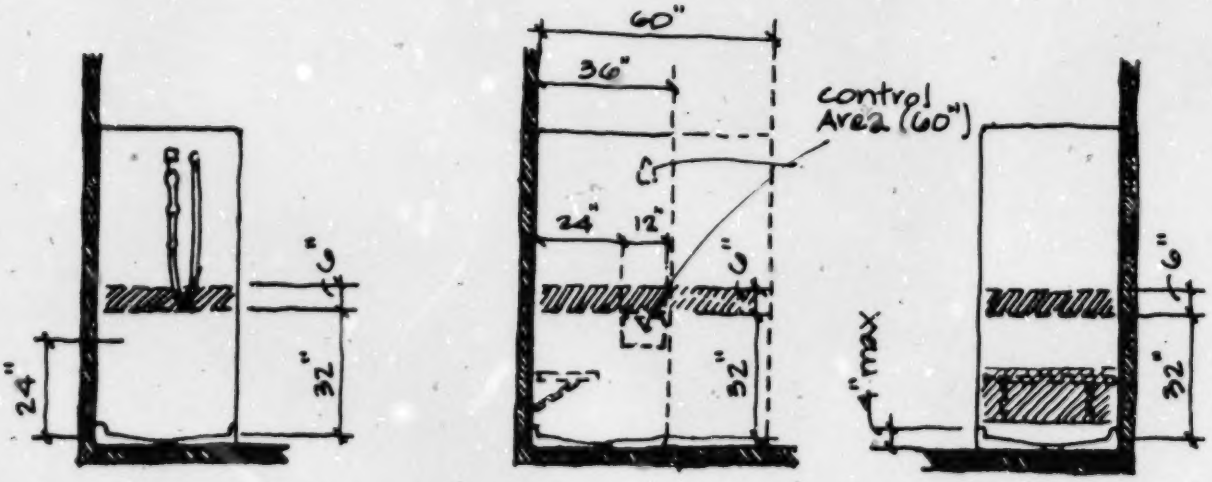
typical showers



Three-foot shower

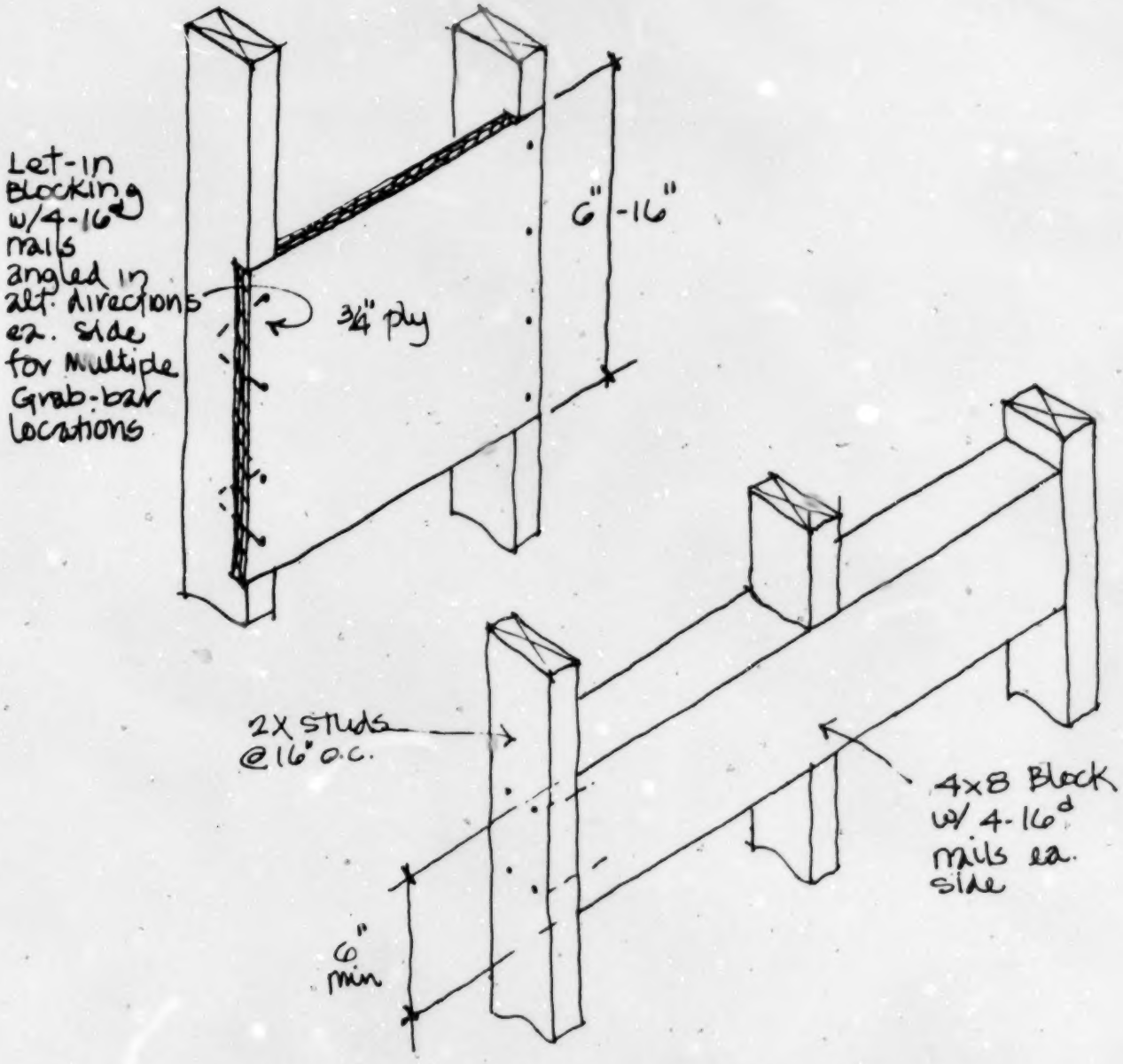


Five-foot Shower



Shower - Grab-Bar Locations

typical blocking


Let-in Blocking w/4-16d nails angled in alt. directions ea. side for multiple Grab-bar locations
3/4" ply
6"-16"
2X STUDS @16" O.C.
4x8 Block w/ 4-16d nails ea. side
6" min

Back-up Blocking for Future Grab-bar Mounting

alarm system

11

If an audible emergency alarm system is to be provided, the housing unit shall be equipped with all the wiring and connections necessary for installation of a visual emergency alarm system as well. This would apply only to alarms that are connected to the building's power supply, such as fire alarms. Battery-powered smoke alarms would not require wiring. A visual fire alarm unit for the deaf provides for an outlet which allows a light that is plugged into it to flash on and off continuously when it is activated by a flasher unit in the building. The necessary circuitry would be installed in all units during construction. To make the system operable, a flasher unit is installed later.

controls

12

Electrical switches, controls and thermostats shall be located at a height of 48 inches. Convenience wall outlets shall be located no lower than 15 inches from the floor, measured from the center line.